

## **ENHANCEMENT OF IN VITRO CULTURE OR VACCINE PRODUCTION USING ELECTROMAGNETIC ENERGY TREATMENT**

### **Abstract of the Disclosure**

Disclosed are apparatus and methods for enhancing or improving cell cultures, including cell cultures for the production of monoclonal antibodies, using electromagnetic energy treatment, primarily using light in the near infrared to visible region of the spectrum. The delivery of light energy to a culture, in accordance with preferred embodiments, enhances or improves the cell culture such as by providing for enhanced and accelerated formation of important biological macromolecules, including, but not limited to, antibodies, proteins, collagen, and polysaccharides, and also providing for accelerated cellular replication and an enhancement or prolongation of the life of cells so treated.

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